

# REPUBLIC OF THE PHILIPPINES

## EDICT OF GOVERNMENT

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PNS/PAES 218 (2005) (English): Agricultural Machinery -- Forage Chopper -- Specifications



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# **PHILIPPINE NATIONAL STANDARD**

**PNS/PAES 218:2005  
(PAES published 2004)  
ICS 65.060**

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**Agricultural Machinery – Forage Chopper – Specifications**



**BUREAU OF PRODUCT STANDARDS**

FEB 21 2006

**National Foreword**

This Philippine Agricultural Engineering Standards PAES 218:2004, Agricultural Machinery – Forage Chopper – Specifications was approved for adoption as a Philippine National Standard by the Bureau of Product Standards upon the recommendation of the Agricultural Machinery Testing and Evaluation Center.

## **Foreword**

The formulation of this national standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) with funding from the Department of Agriculture.

This standard has been technically prepared in accordance with BPS Directives Part 3:2003 – Rules for the Structure and Drafting of International Standards.

The word “shall” is used to indicate mandatory requirements to conform to the standard.

The word “should” is used to indicate that among several possibilities one is recommended as particularly suitable without mentioning or excluding others.

In the preparation of this standard, the following documents/publications were considered:

ISO 8909-1:1994 (E/F), Forage Harvesters – Part 1: Vocabulary.

ISO 8909-2:1994 (E), Forage Harvesters – Part 2: Specifications of characteristics and performance.

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**Agricultural Machinery – Forage Chopper – Specifications**

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**1 Scope**

This standard specifies the requirements for construction and performance of stationary forage chopper.

**2 References**

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this National Standard:

<b>PAES 102: 2000</b>	Agricultural Machinery – Operator’s Manual – Content and Presentation
<b>PAES 103:2000</b>	Agricultural Machinery – Method of Sampling
<b>PAES 219:2004</b>	Agricultural Machinery – Forage chopper – Methods of Test
<b>PAES 311:2001</b>	Engineering Materials – Bolts and Nuts for Agricultural Machines – Specifications and Applications
<b>PAES 313:2001</b>	Engineering Materials – Screws for Agricultural Machines – Specifications and Applications

**3 Definitions**

For the purpose of this standard the following definitions shall apply:

**3.1****blow-up type**

type of forage chopper where the chopped materials are blown up through the blow-up pipe

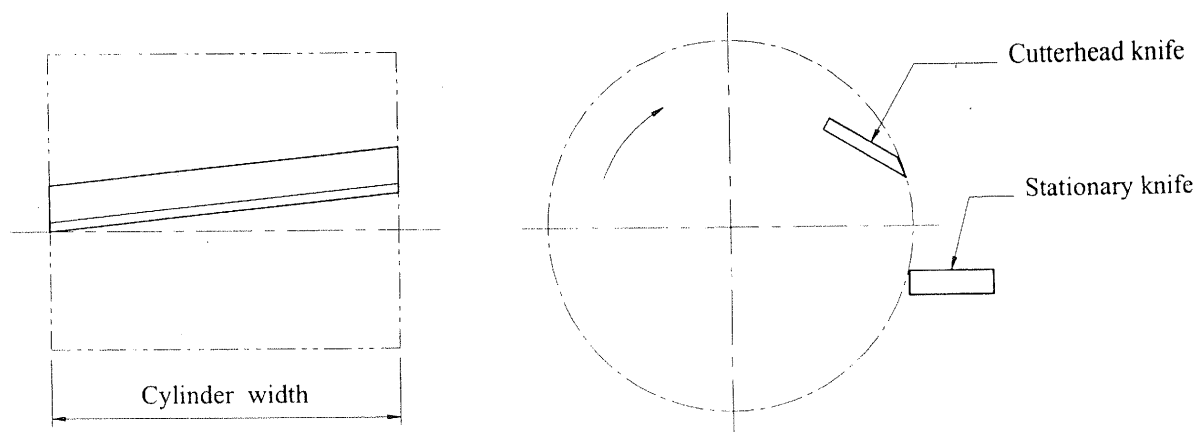
**3.2****cutterhead**

cutting rotor

devices intended to cut the crop into short lengths with reasonable consistency within a range of optional settings

**3.3****cylinder cutterhead**

knives on cylindrical mountings such that the cutting edges of the knives are essentially parallel to the axis of rotation (see Figure 1)

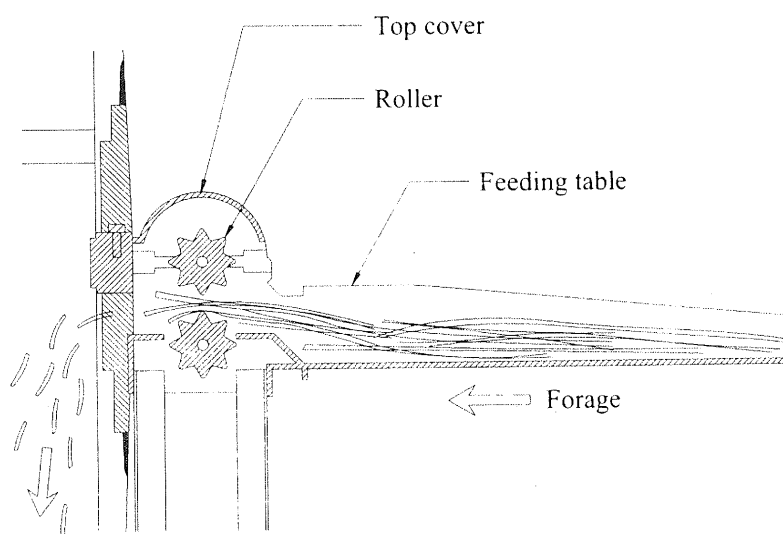


**Figure 1 – Cylinder cutterhead**

### 3.4

#### **feedroll**

cylindrical roll generally with protrusions or flutes, used to gather, compress and advance the crop into the cutterhead (see Figure 2)



**Figure 2 – Feed rollers**

#### 3.4.1

##### **flywheel cutterhead**

knives mounted essentially radially with the cutting edges describing a plane perpendicular to the axis of rotation (see Figure 3)

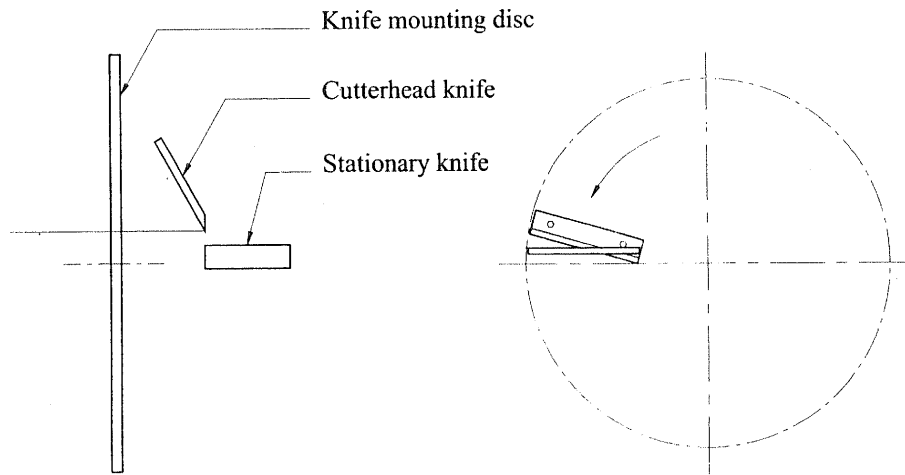


Figure 3 – Flywheel cutterhead

### 3.5

#### forage chopper

machine used to cut the crop into short parallel lengths (see Figure 4)

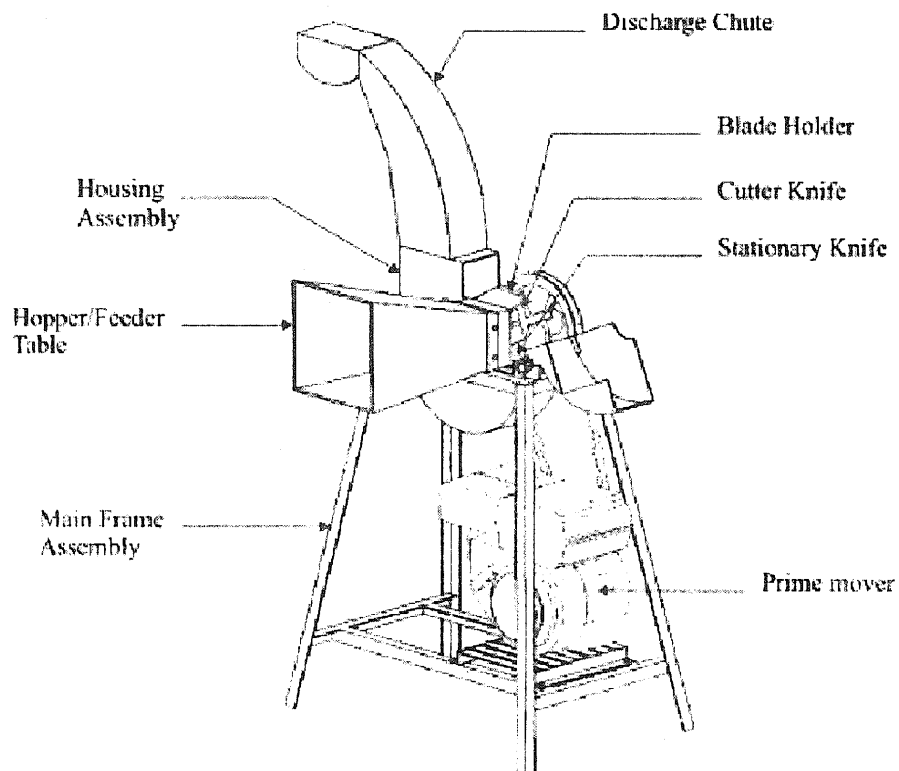


Figure 4 – Typical design of forage chopper

### 3.6

#### let-fall type

type of forage chopper where the chopped materials are dropped down to the bottom of machine



**3.7****precision-cut forage chopper**

forage chopper which uses a feeding mechanism consisting of four or more feed rolls to partially orient and advance the crop at a consistent rate into the cutting mechanism

NOTE This type of forage chopper is capable of producing the shortest and most uniformly cut particles.

**3.8****random-cut forage chopper**

forage chopper without a distinct feeding mechanism, usually employing flails to impact-cut and chop crop directly into shorter pieces

NOTE This type of forage chopper usually produces the longest mean particle lengths, and the least uniformly cut particles.

**3.9****semi-precision-cut forage chopper**

forage chopper which uses a feeding mechanism consisting of two feed rolls, or other means such as an auger, to advance the crop to the cutting mechanism

NOTE Mean particle lengths and particle uniformity are intermediate between those obtained with precision cut and random-cut forage choppers.

**3.10****stationary knife**

shear bar

fixed plate providing a stationary edge against which the cutterhead knives shear the crop

**3.11****throw-away type**

type of forage chopper where the chopped materials are thrown away to the front area of the machine

**4 Classification**

The classification of forage chopper shall be based according to the following:

**4.1 Feeding mechanism****4.1.1 precision-cut****4.1.2 semi-precision-cut****4.1.3 random-cut****4.2 Chopping mechanism****4.2.1 Cylinder cutterhead****4.2.2 Fly-wheel cutterhead**

#### 4.3 Discharging mechanism

##### 4.3.1 Let-fall type

##### 4.3.2 Throw-away

##### 4.3.3 Blow-up type

### 5 Materials of Construction

5.1 Steel bars and heavy-duty mild steel shall be generally used for the manufacture of the different components of the forage chopper.

5.2 Knives shall be made of AISI 1080 to AISI 1085 or its ISO equivalent.

5.3 Bolts and screws to be used shall conform with the requirements of PAES 311 and PAES 313.

### 6 Performance Requirements

The forage chopper when tested in accordance with PAES 219 shall conform to the following requirements:

6.1 Precision-cut and semi-precision cut forage chopper shall be able to cut at least three different length settings with 5% maximum variation of cut.

6.2 The forage chopper shall produce a clear-cut chopped material.

6.3 The noise emitted by the forage chopper shall not be more than 96 db (A).\*

### 7 Design and Workmanship

7.1 Cutting mechanism shall be accessible.

7.2 Knives shall be individually adjustable, replaceable and can be easily sharpened.

7.3 There should be provision for adjusting the clearance of flywheel/cylinder and stationary knife.

7.4 For random fed forage chopper, the length of the feeding table shall not be less than the arm length.

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\* Allowable noise level for four (4) hours of continuous exposure based on Occupational Safety and Health Standards, Ministry of Labor, Philippines. 1983.

**7.5** The base of the forage chopper shall be rigid and all components shall be dynamically balanced for stable running with low noise level.

**7.6** The forage chopper shall be free from manufacturing defects that may be detrimental to its operation.

**7.7** Any uncoated metallic surfaces shall be free from rust and shall be painted properly.

**7.8** The forage chopper shall be free from sharp edges and surfaces other than cutting mechanism that may injure the operator.

**7.9** Belt cover or guard and provisions for belt tightening and adjustments shall be provided.

**7.10** Mechanism for immediate load disengagement between primemover and forage chopper shall be provided to protect primemover from over loading and the operator in case of accident.

## **8 Warranty for Construction and Durability**

**8.1** Warranty against defective materials and workmanship shall be provided for parts except for normal wear and tear of consumable maintenance parts such as belts within six months from the purchase of the forage chopper and one year warranty for services.

**8.2** The construction shall be rigid and durable without breakdown of its major components (i.e. cutting assembly, etc) for at least six months from purchase by the first buyer.

## **9 Maintenance and Operation**

**9.1** Each forage chopper unit shall be provided with a set of manufacturer's standard tools required for maintenance.

**9.2** An operator's manual, which conforms to PAES 102, shall be provided.

## **10 Sampling**

The forage chopper shall be sampled for testing in accordance with PAES 103.

## **11 Testing**

Sampled forage chopper shall be tested in accordance with PAES 219.

## **12 Marking**

**12.1** Each forage chopper shall be marked in English with the following information using a stencil or by directly punching it in a plate and shall be positioned at the most conspicuous place:

**12.1.1** Registered trademark of the manufacturer

**12.1.2** Brand

**12.1.3** Model

**12.1.4** Serial number

**12.1.5** Input capacity, kg/h

**12.1.6** Recommended chopping speed, rpm

**12.1.7** Power requirement, kW

**12.1.8** Name and address of the manufacturer

**12.1.9** Name and address of the importer, if imported

**12.1.10** Country of manufacture (if imported) / “Made in the Philippines” (if manufactured in the Philippines)

**12.2** Safety/precautionary markings shall be provided when appropriate. Marking shall be stated in English and Filipino and shall be printed in red color with a white background.

**12.3** The markings shall have a durable bond with the base surface material.

**12.4** The markings shall be weather resistant and under normal cleaning procedures, it shall not fade, discolor, crack or blister and shall remain legible.